



3rd CLASS MAIL

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725 REDDICK AVENUE / SANTA BARBARA, CALIFORNIA 93103

COMPUTER DESIGN

T NELSON, SYS CNSLT

A

P O BOX 3
SCHOOLEYS MTN NJ 07870

PURCHASE ORDER NO.:



October 9, 1972

T. Nelson - Sys Conslt
P.O. Box 3
Schooleys Mtn, N.J.

Attention:

Subject: The D.A.C. X-Y Table

Thank you for your recent inquiry on the D.A.C. numerically controlled X-Y table.

The D.A.C. X-Y table is designed to provide fast, accurate coordinate positioning for a variety of applications including circuit board drilling, pin insertion, photo-plotting and other tooling needs.

The machine can be furnished either with or without numerical controls. Two basic types of numerical control systems are offered including the Summit Engineering stepping motor system and the Tektronix Model 1711 servo feedback system.

We have enclosed catalog literature on the table as well as a price list. We have also enclosed literature on the DAC/DRILL circuit board drilling machine which utilizes the basic D.A.C. X-Y table.

Thank you for your interest in our products. Please contact us or our Representative, whose address is indicated below, if we can provide further information that will be helpful.

Yours very truly

Edward W. Vernon
President

EWV:mh

Enclosures

Represented by:

NUMERICALLY CONTROLLED dac x-y table



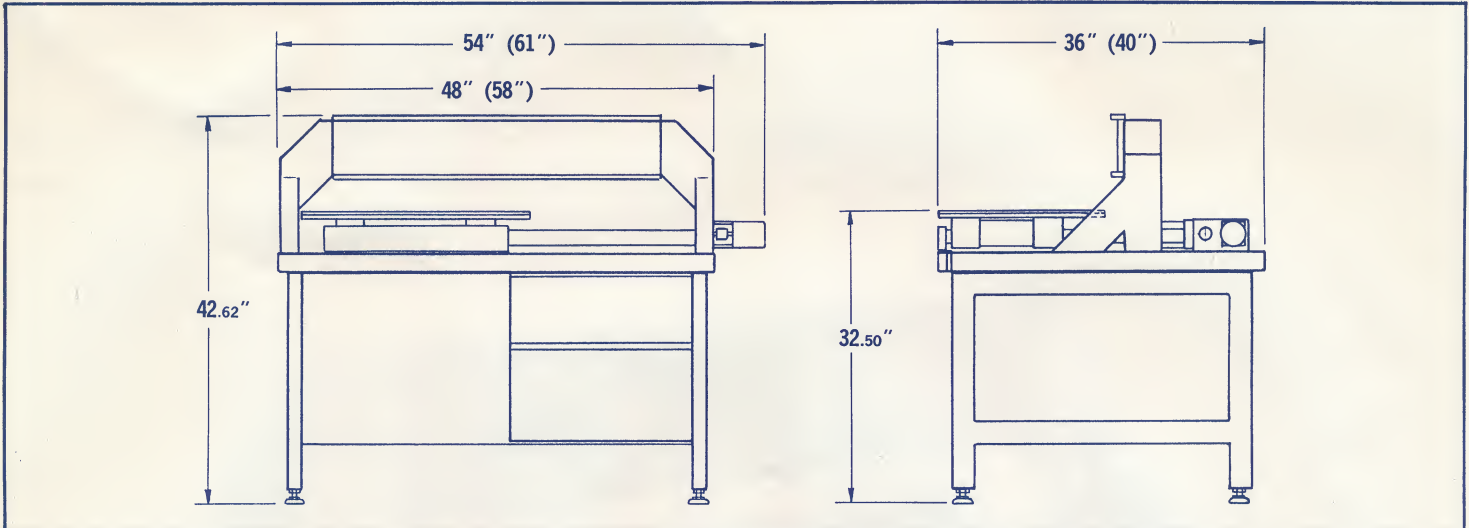
Model 9000 DAC X-Y table with
Model 60 Numerical Control System,
keyboard and joy stick.

The DAC X-Y Table — Model 8000 and 9000

A fast, accurate numerically controlled X-Y table for a variety of positioning and assembly applications. A rigid overhead beam allows mounting of optics, drill spindles, wire wrap head, routing spindles, pin insertion tools, light sources or other tools.

A welded tubular steel frame supports the Benelex table top. The X-Y table, a low inertia, truss type structure moves on hardened and ground ways. Pre-loaded cam follower bearings are used to provide smooth accurate motion. Zero backlash ball screws position the table.

Either of two numerical control systems are offered. The Model 60 (Summit Engineering) stepping motor incremental type system offers high speed accurate positioning at a most reasonable price. ASCII or EIA tape codes may be used with the Summit Engineering format. The Model 65 N.C. (Tektronix 1711) an absolute, servo motor system provides compatibility with the G.E. Mark Century, Westinghouse and other EIA code, word address systems.



SPECIFICATIONS

	8000	9000
Table size	18" x 25" (457 x 635mm)	20" x 30" (508 x 762mm)
Table travel	15" x 18" (381 x 457mm)	18" x 20" (457 x 508mm)
Traverse rate		150 to 240 in/min (3810 to 6100 mm/min)
Positioning accuracy		.002" true position (.05mm)
Linear accuracy		.0005 in/foot max. lead screw error
Repeatability		.0005" (.013mm)

NUMERICAL CONTROL SYSTEMS

Model 60 N.C.

The numerical indexer, tape reels and reader are drawer mounted. All indexer circuitry is on modular plug-in cards in the drawer. Integrated circuits are used for packaging density and reliability.

Controls, power switches, keyboard, and joystick are mounted on a tilt-out panel.

ASCII or EIA Code low cost system. Teletypewriter tape preparation. Mechanical tape reader. Min. step .001". Traverse rates to 200 inches/minute. Includes stepping motor drive system, 5 pitch ball lead screws. N.C. indexer operable from punched tape or manual controls. Direction and axis switches as well as run or jog switch included. Joystick motion control and/or keyboard system for individual command entry furnished at extra cost.

Model 65 N.C.

Word address, EIA, ASCII or ISO code system. Tape compatibility with G.E. Mark Century and Westinghouse controllers.

The Tektronix Model 1711 numerical control furnished with the DAC X-Y table is a two axis point-to-point closed loop system with .0001" (0.0025mm) position resolution. Utilizes photo-electric tape reader. Traverse rates up to 240 inches/minute (6 meters/minute). The Model 65 numerical control is a separate console measuring 20" wide x 21" deep x 34" high. See DAC/DRILL brochure for illustration.

The DAC X-Y table includes the frame, table top, X-Y table, overhead beam with "I" beam tool mount, and lead screws with bellows covers. Stepping motors, motor cabling, limit switch stops and pre-wired limit switches are provided with the machine if the Model 60 numerical control is ordered. Servo motor amplifier-resolver package, cabling and limit switches are provided with the Model 65 numerical control.

D.A.C. 725 REDDICK AVENUE / SANTA BARBARA, CALIFORNIA 93103 / (805) 963-3708





MODEL 9000 DAC/DRILL WITH DIGITIZER

One to three spindle versions available. Spindles may be added in the field. Digitizing option includes joystick, digital readout and projection scope and tapes may be prepared directly from artwork.

Illustrated with Model —36 high frequency spindle, 30,000 to 80,000 RPM, feed rates to 200 I.P.M., air bearings, centrifugal collet and air sleeve.

Hit rates to 90 holes per minute, drill area 18" x 20" with single spindle, 18" x 16" with two spindles and 18" x 12" with three spindles.

Includes removable tooling plate, microscope/reticle "Zero" and air system.

Price \$20,000.00 to \$30,000.00.



INCREASE DRILL AREA – ELIMINATE DOWN TIME

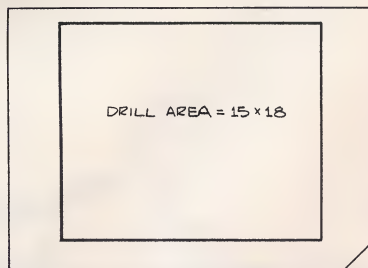
TOOLING PLATES FOR MULTIPLE SPINDLE DAC/DRILLS

Replaceable tooling plates for the DAC/DRILL allow maximum drill area to be covered under multiple spindles and rapid change-over from single spindle configuration.

The precision DAC plates should be used in pairs to allow the drilling cycle to continue while replacement of completed work with new stacks is being accomplished. Quick change clamps and ground stops permit rapid accurate exchange of tooling plates.

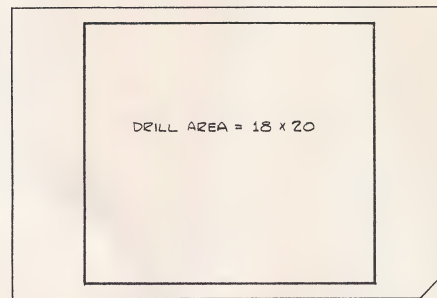
Over-size plates illustrated below provide enlarged drill areas for multiple spindle drilling applications, yet the maximum drill area with single spindle operation is still retained.

8000 SERIES TOOLING PLATES



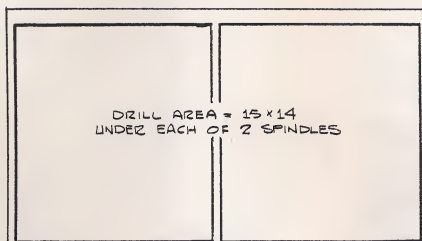
18 x 25 TOOLING PLATE NO. C10098

9000 SERIES TOOLING PLATES



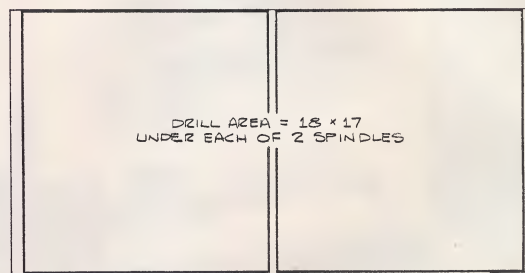
20 x 30 TOOLING PLATE NO. C10287

STANDARD TOOLING PLATES

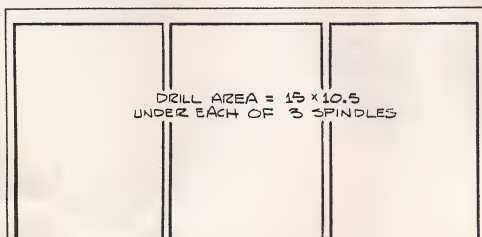


18 x 29 TOOLING PLATE NO. C10285

2 SPINDLE TOOLING PLATES

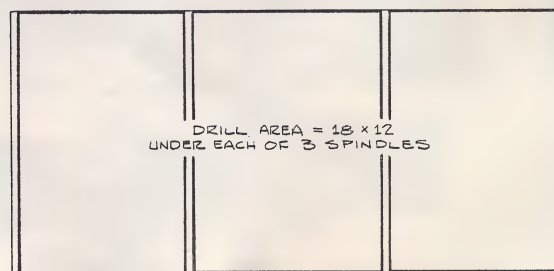


20 x 36 TOOLING PLATE NO. C10288



18 x 36 TOOLING PLATE NO. C10286

3 SPINDLE TOOLING PLATES



20 x 38 TOOLING PLATE NO. C10276

NUMERICALLY CONTROLLED **dac/drill**

**printed circuit board drilling machine
with tape making option**



**Model 9001-36/36/36 DAC/DRILL with 30,000 to 80,000 RPM
high frequency air bearing spindle, variable rate feed
mechanism and Model 60 Numerical Control System.**

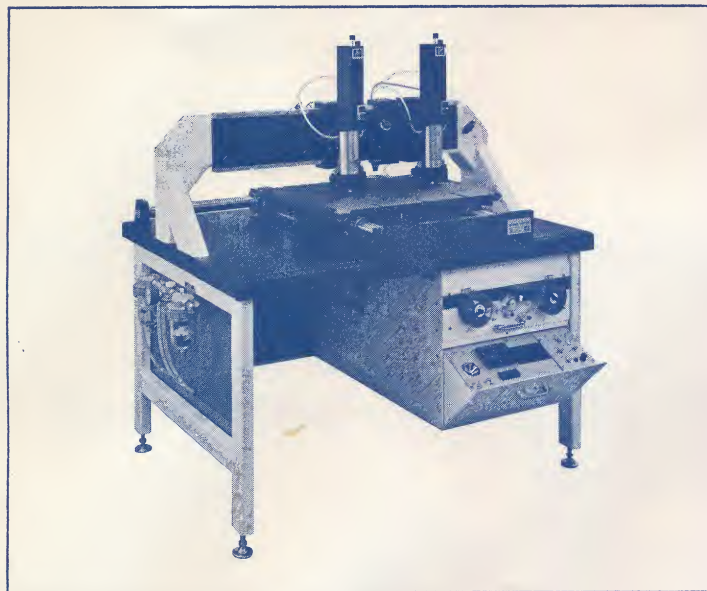
The DAC/DRILL — Model 8001 and 9001

The DAC/DRILL provides an economical numerically controlled circuit board drill for medium and short run production applications. The versatility and cost saving features of numerical control can now be realized by prototype and job shop facilities.

The DAC/DRILL is a basic machine that allows one to three drill heads to be mounted on a rigid welded structure. These heads may be positioned at any location along a ground "I" type mounting beam. The particular type of head best suited to the application may be selected and furnished as standard equipment on the DAC/DRILL. The X-Y table is a rigid, low inertia, truss type struc-

ture and moves on hardened and ground ways under the drill heads. Pre-loaded cam follower bearings are used to guide the table. Table positional accuracy, including perpendicularity and straightness is within .002" of true theoretical grid position. Repeatability is .0005".

Each DAC/DRILL includes a quick change tooling plate allowing board loading to be made off the machine so loading and drill time may over-lap. The DAC/DRILL can be equipped with accessories including a digital readout, projection scope and tape making system.

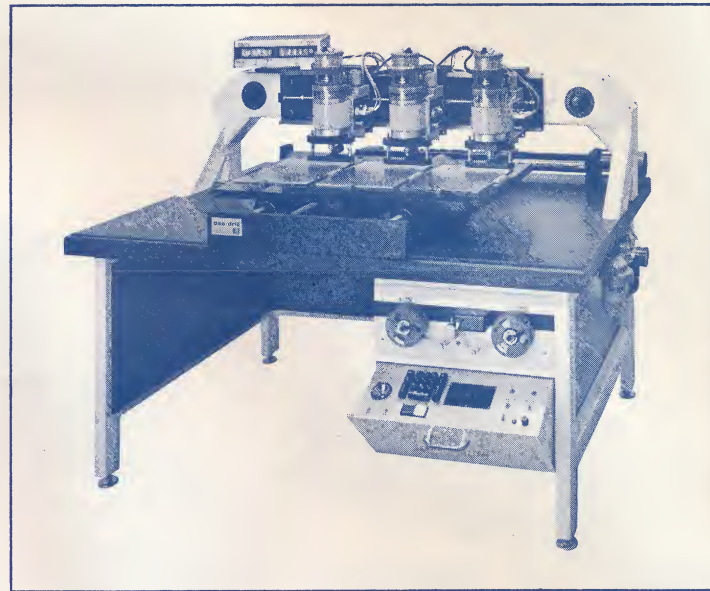


Model 8001 — 36/36 DAC/DRILL with Model 60 N.C. System

The Model 8001 or Model 9001 DAC/DRILL is furnished as a compact desk type machine with the numerical indexer, tape reels and reader mounted on a pull out drawer. All indexer circuitry is available on modular plug-in cards mounted in the drawer. Integrated circuits are used for packaging density and reliability.

Controls, power switches, keyboard, joystick and spindle switches are mounted on a tilt-out panel.

A microscope/reticle system is furnished on all numerically controlled DAC/DRILLS to provide a mechanical "Zero" reference for set-up and starting point use as well as a point to "close the loop" after each complete drilling operation.

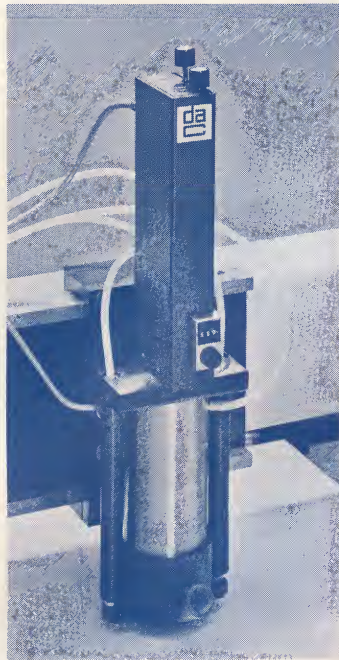


Model 9001-32/32/32 DAC/DRILL with Digital Readout and Model 60 N.C.

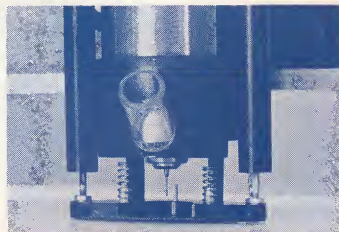
The machine frame is welded tubular steel with leveling pads on each leg. The table top is of Benelux, a stable dense tooling plate type of material. The steel front rail of the machine is recessed into the top. The 8000 series table measures 48" wide X 36" X 27" high (to the table top). The X-Y table is of ground flat aluminum plate and located 5" above the console table top. Stops are provided on the X-Y table for locating the removable tooling plate. The beam is 4" above the X-Y table. The 9000 series table measures 58" wide X 40" deep X 27" high. This machine varies from the 8000 series in that a larger X-Y table top and drill area are provided.

SPECIFICATIONS	8000 SERIES	9000 SERIES
Machine Dimensions	48" X 36" X 42" high 1220 X 915 X 1067mm	58" X 40" X 42" high 1473 X 1016 X 1067mm
Table Size	18" X 25" 457 X 635mm	20" X 30" 508 X 762mm
Tooling Plates (Interchangeable)	18" X 25" 457 X 635mm	20" X 30" 508 X 762mm
	18" X 29" 457 X 737mm	20" X 36" 508 X 914mm
	18" X 36" 457 X 914mm	20" X 38" 508 X 965mm

SPECIFICATIONS	8000 SERIES	9000 SERIES
Drill Area		
Single Spindle	15" X 18" 381 X 457mm	18" X 20" 457 X 508mm
Two Spindle	15" X 14" 381 X 356mm	18" X 17" 457 X 432mm
Three Spindle	15" X 10.5" 381 X 267mm	18" X 12" 457 X 305mm
Positioning System	Zero backlash ball screws — Stepping Motor or Servo Motor Drive	
Positioning Accuracy	.002" T.P. — (.05mm)	
Positioning Repeatability	.0005" (.013mm)	
Drill Rate	70 to 150 strokes per minute depending on drill head and numerical control selection	



MODEL 36 DRILL HEAD



MODEL 36 COLLET,
PRESSURE FOOT,
SHROUD DETAIL

DRILL HEADS

—32 Drill Head

Precise 65H Head, 0 to 45,000 RPM, 115V AC 60 Hz Air/Hydraulic feed mechanism. 1" stroke. Feed rate to 120 inches/minute. #0 Jacobs chuck or collets. A "work horse" head for standard quality applications. Covers hole size from 3/16 to #60. (4,76 to 1,00 mm)

—33 Drill Head

High frequency ball bearing spindle. 15,000 to 60,000 RPM, 1/8" collet for common shank drills. Holes up to 1/4" dia. may be drilled with this spindle. Air bearing sleeve for Z axis guidance. DAC/DRIVER feed mechanism for infeed rates to 200 I.P.M.

—36 Drill Head

Westwind 109 spindle. 30,000 to 80,000 RPM, 3 ϕ AC powered. Air bearings and 1/8" centrifugal collet for common shank drills. Holes up to 1/8" dia. may be drilled at production rates. Spindle runout of .0002" max. Spindle is mounted in an air sleeve "Z" axis slide for ultimate in guidance precision. Variable rate feed mechanism — the DAC/DRIVER provides feed rates from 12 to 200 inches/minute (300 to 5000 mm/minute). Light sensing limit switches for reliability. Adjustable top and lower limit stops with stroke to .7" (18 mm). 5 CFM (0,14 m³/min.) air required per spindle. Pneumatic pressure foot — used on —33 and —36 drill head. Force to 40 lbs. (18 kp) independent of spindle. Detail shows chip removal shroud "open" for drill replacement in 109 spindle.

NUMERICAL CONTROL SYSTEMS

Either EIA or ASCII code systems can be provided in a variety of formats. DAC/DRILLS are often supplied with tape format to match the existing high production machine such as Excellon, Digital Systems or Gardner-Denver. Standard DAC numerical control systems are listed below.

MODEL 60 — ASCII or EIA Code low cost system. Teletypewriter tape preparation. Mechanical tape reader. Min. step .001". Traverse rates to 200 inches/minute. Includes stepping motor drive system, 5 pitch ball lead screws. N.C. indexer operable from punched tape or manual controls. Direction and axis switches as well as run or jog switch included. Joystick motion control and/or keyboard system for individual command entry furnished at extra cost.

JOYSTICK POSITION CONTROL

Four position joystick to allow free run and jog control of X and Y axis. Quick manual positioning system. Provided with Model 95 Digitizer at no extra charge.

KEYBOARD ENTRY UNIT FOR N.C. INDEXER

Provides keyboard for entry of all functions (X and Y motion and drill cycle) into indexer. Accessory for Model 60 indexer.

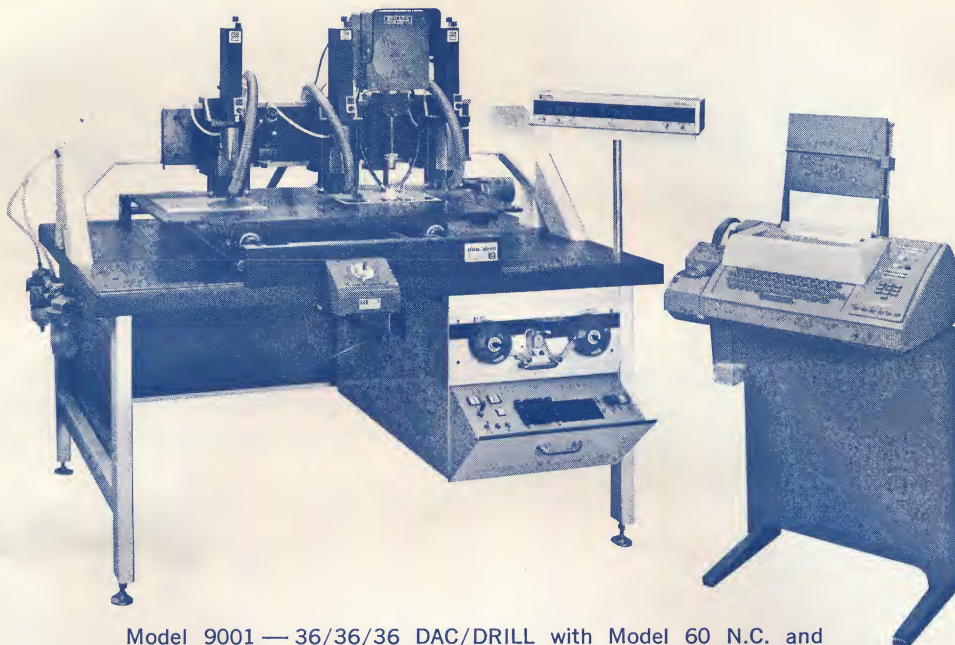
MODEL 65 (Tektronix 1711)

Word address, EIA, ASCII or ISO code system. Tape compatibility with G.E. Mark Century and Westinghouse controllers.

The Tekronix Model 1711 numerical control adapted to the DAC/DRILL is a two axis point-to-point closed loop system with .0001" (0,0025mm) position resolution. Utilizes photo-electric tape reader. Traverse rates up to 240 inches/minute (6 meters/minute) and drill hit rates to 150 per minute when used in conjunction with the DAC Model —36 drill head. Allows DAC/DRILL to utilize tapes from most Excellon, Edlund and Gardner-Denver machines.



Model 9001 — 36/36/36
with Model 65 Numerical Control



Model 9001 — 36/36/36 DAC/DRILL with Model 60 N.C. and Model 95 Digitizer, Model 72 Projection Scope, Teletypewriter and special 3 speed "add on" Joystick.

DAC/DISPLAY — MODEL 90

This digital readout system presents X and Y coordinates (5 digits) and plus or minus sign. Absolute or incremental count. Resolution to .001". Useful for coordinate measuring, digitizing, or reference and locating aid for drilling.

DAC/DIGITIZER — Model 95

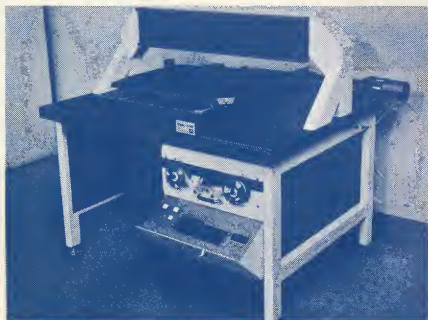
A complete tape making system when used with a projection scope and tape punch. Includes Model 90 DAC/DISPLAY, joystick control for table positioning and interface to tape punch. Footswitch closure punches dimensional information as shown on display and enters drill command in proper format. A tape punch, Flex-o-writer or Teletypewriter can be used to produce the tape.

MODEL 72 PROJECTION SCOPE

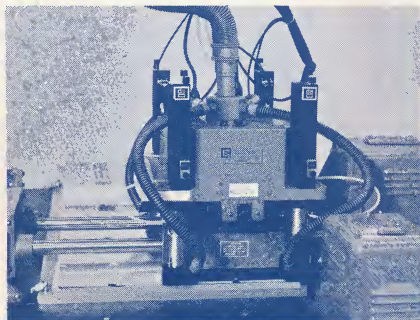
A clear sharp surface illuminated projection scope with 6" dia. screen. Concentric circle overlay aids in locating artwork exactly at center of circuit board pads. Illumination provides intense cool light for bright image but does not distort film.

ORDERING INFORMATION

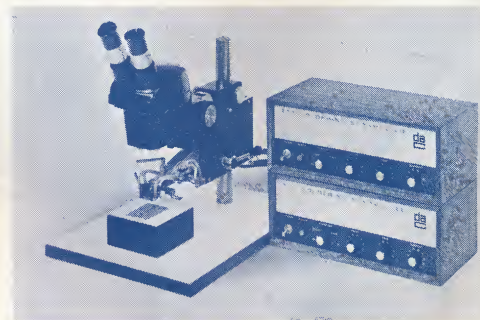
Specify the basic machine, Model 8001 or 9001, followed by the drill head(s) desired and the type of N.C. system. List options such as projection scope, keyboard, joystick or digital readout as separate items. Quotations on non-standard formats and special machine will be furnished.



MODEL 9001 NUMERICALLY CONTROLLED X-Y TABLE with Universal Beam for mounting of insertion head, light heads, etc.



DACUMATIC SPINDLE CONVERSION FOR EXCELLON QUADRAMATICS
High speed spindle system to improve productivity and hole quality of Quadramatic drills.



MDS - MULTILEAD DUAL SOLDERING SYSTEM — for I.C. flat packs.

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